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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample and a personnel evaluation form are also included. (AG)

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S-43R

TM 001 247

Development of USTES Aptitude Test Battery

for

Automobile Mechanic

(auto. ser.) 620.281

Foreign Car Mechanic

(auto. ser.) 620.281

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
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U.S. DEPARTMENT OF LABOR

MANPOWER ADMINISTRATION

Technical Report on Development of USTES Aptitude Test Battery

For . . . . .

Automobile Mechanic (auto. ser.) 620.281
Foreign Car Mechanic (auto. ser.) 620.281

S-43R

(Developed in cooperation with the California, Illinois, Louisiana, Maryland, Massachusetts, Missouri, New Jersey, New York, Ohio, Oregon, Pennsylvania, Tennessee and Texas State Employment Services)

Manpower Administration
U. S. Department of Labor

February 1969

FOREWORD

The United States Training and Employment Service General Aptitude Test Battery (GATB) was first published in 1947. Since that time the GATB has been included in a continuing program of research to validate the tests against success in many different occupations. Because of its extensive research base the GATB has come to be recognized as the best validated multiple aptitude test battery in existence for use in vocational guidance.

The GATB consists of 12 tests which measure 9 aptitudes: General Learning Ability, Verbal Aptitude, Numerical Aptitude, Spatial Aptitude, Form Perception, Clerical Perception, Motor Coordination, Finger Dexterity, and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, with a standard deviation of 20.

Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, in combination, predict job performance. For any given occupation, cutting scores are set only for those aptitudes which contribute to the prediction of performance of the job duties of the experimental sample. It is important to recognize that another job might have the same job title but the job content might not be similar. The GATB norms described in this report are appropriate for use only for jobs with content similar to that shown in the job description included in this report.

GATB Study #2738

Development of USTES Aptitude Test Battery

For

Automobile Mechanic (auto. ser.) 620.281-014
Foreign Car Mechanic (auto. ser.) 620.281-014

S-43R

This report describes research undertaken for the purpose of developing General Aptitude Test Battery (GATB) norms for the occupation of Automobile Mechanic (auto. ser.) 620.281-014 and Foreign Car Mechanic (auto. ser.) 620.281-014. The following norms were established:

GATB Aptitudes	Minimum Acceptable GATB Scores
N - Numerical Aptitude	75
S - Spatial Aptitude	95
M - Manual Dexterity	90

RESEARCH SUMMARY

Sample:

247 male employees working for authorized Volkswagen dealers throughout the United States.[1]

Criterion:

Supervisory ratings

Design:

Concurrent (Criterion data were collected shortly after workers returned from training session. As workers were tested after a period of on-the-job training, design must be considered concurrent).

Minimum aptitude requirements were determined on the basis of a job analysis and statistical analyses of aptitude mean scores, standard deviations and selective efficiencies.

Concurrent Validity:

Phi Coefficient = .25 ($P/2 < .0005$)

[1] Although data collection for this study preceded establishment of a policy that data on minority group membership was to be obtained in all test development studies, such information was obtained in some State agencies. Approximately fifteen members of the sample were identified as being "nonwhite".

Effectiveness of Norms:

Only 62% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 71% would have been good workers. 38% of the nontest-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms only 29% would have been poor workers. The effectiveness of the norms is shown graphically in Table 1:

TABLE 1

Effectiveness of Norms

	Without Tests	With Tests
Good Workers	62%	71%
Poor Workers	38%	29%

SAMPLE DESCRIPTION

Size:

The total usable sample was 247.

Occupational Status:

Employed workers attending a special one week training session at fourteen regional Volkswagen training centers. This training is required for all Volkswagen "general repair" mechanics after three months on-the-job experience. These centers are located in Massachusetts, New York, Maryland, Pennsylvania, Florida, Michigan, Ohio, Illinois, Missouri, Louisiana, Texas, Oregon and Los Angeles and San Francisco, California.

Work Setting:

Workers were employed by authorized Volkswagen dealers in virtually all continental States.

Employer Selection Requirements:

Education: No requirement

Previous Experience: None required

Tests: None

Other: Personal interview

Principal Activities:

The job duties for each worker are comparable to those shown in the job description in the Appendix.

Minimum Experience:

Most workers in the sample had at least three months total job experience.

TABLE 2

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations, with the Criterion (r) for Age, Education and Experience.

	Mean	SD	Range	r
Age (years)	27.1	7.5	17-54	.10
Education (years)	10.9	2.6	0-15	.00
Experience (months)	29.1	46.9	0-294	.09

In addition to the sample described above, a usable sample of 129 employed workers was obtained from Volkswagen dealerships in the States in which the training centers were located plus the State of Tennessee.

EXPERIMENTAL TEST BATTERY

All 12 tests of the GATB, B-1002B, were administered during the period October 1965 through March 1966 while workers were attending training at one of the fourteen regional training centers. The Minnesota Vocational Interest Inventory (MVII) and a specially developed biographical information blank (BIB) were also administered at this time.

CRITERION

Two criteria were obtained for this study shortly after the completion of training.

Rating Scale:

Supervisory ratings of job proficiency were obtained on Form SP-21, "Descriptive Rating Scale". The scale (see Appendix) consists of seven items covering different aspects of job performance. Each item has five alternatives corresponding to different degrees of job proficiency. These ratings were obtained in person by the responsible occupational test development analyst when the worker was employed in the same State where training had taken place. These ratings were obtained by mail when the worker was employed in another State.

The cover letter used when workers were employed out of State is shown in the Appendix.

Production Records:

Criterion scores were derived from standardized monthly production records maintained by all Volkswagen dealers. The scores were in effect a ratio computed from the following formula:

$$\text{Flat Rate} \div \text{Actual Time} \times 100$$

Reliability:

For a subsample of workers a second rating was obtained about two weeks after the first rating and a second set of production records was obtained for the month following the period covered by the first record. These second criterion measures were obtained so that an estimate of the criterion reliability could be made. The correlation between the two sets of production records is .55 for the 93 cases available. The elimination of one questionable case raised this correlation to .70 which indicates low but acceptable criterion reliability. The final criterion consisted of supervisory ratings only due to the lower criterion reliability of the production records and the failure of this criterion to correlate with predictors.[1/]

The correlation between the two sets of ratings is .87 for 85 cases available.

Relationship Between Criteria:

The correlation between supervisory ratings and production records is .27.

Criterion Score Distribution:

	Ratings	Production Records
Possible Range	7-35	10-300(range of scores considered reasonable)
Actual Range	11-35	0-216
Mean	24.1	114.4
Standard Deviation	4.4	27.2

Criterion Dichotomy:

The distribution of scores on the final criterion was dichotomized into low and high groups by placing 38% of the sample in the low criterion group to correspond with the percentage of workers considered unsatisfactory or marginal. Workers in the high criterion groups were designated as "good workers" and those in the low group as "poor workers". The criterion critical score is 23.

APTITUDES CONSIDERED FOR INCLUSION IN THE NORMS

Aptitudes were selected for tryout in the norms on the basis of a qualitative analysis of the job duties involved and statistical analyses of test and criterion data. Aptitude S which does not have a signficant correlation with the criterion was considered for inclusion in the norms because the qualitative analysis indicated that it is important for the job duties and the sample had a relatively high mean on this aptitude. With employed workers, a relatively high mean may indicate some sample preselection. Tables 3, 4, and 5 show the results of the qualitative and statistical analyses.

1/ Although it was believed that production record were standardized two problems were encountered during conduct of the study which raised questions about the validity of the production record criterion: (a) in a number of dealerships down time (time sick, time waiting for jobs, etc. was added into the "actual time" figure and (b) some dealerships paid by the job while others paid by the hour making the "actual time" figures much more important to some mechanics than to others.

TABLE 3

Qualitative Analysis

(Based upon the job analysis, the aptitudes indicated appear to be important to the work performed.)

Aptitude	Rationale
S - Spatial Aptitude	Necessary in order to visualize interrelationships of engine parts and components.
P - Form Perception	Necessary in inspection of defective parts or units to determine degree of wear, irregularity and serviceability.
F - Finger Dexterity	Necessary in manipulation of small parts and making of fine adjustments.
M - Manual Dexterity	Necessary in use of various hand and power tools such as pliers, screw drivers, wrenches, hammers, hydraulic lifts and jacks.

TABLE 4

Means, Standard Deviations (SD), Ranges and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB, N=247.

Aptitudes	Mean	SD	Range	r
G - General Learning Ability	96.9	17.1	51-150	.262**
V - Verbal Aptitude	93.2	14.3	65-151	.211**
N - Numerical Aptitude	91.1	18.2	38-134	.250**
S - Spatial Aptitude	114.4	17.8	58-156	.105
P - Form Perception	104.3	19.3	45-148	.171**
Q - Clerical Perception	104.0	14.1	69-143	.236**
K - Motor Coordination	98.0	18.5	0-149	.153*
F - Finger Dexterity	99.3	17.4	52-143	.089
M - Manual Dexterity	112.3	20.8	36-176	.145*

*Significant at the .05 level
**Significant at the .01 level

TABLE 5

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important				X	X			X	X
Irrelevant									
Relatively High Mean				X	X	X			X
Relatively Low Standard Dev.		X				X			
Significant Correlation with Criterion	X	X	X		X	X	X		X
Aptitudes to be Considered for Trial Norms	G	V	N	S	P	Q	K		M

DERIVATION AND VALIDITY OF NORMS

Final norms were derived on the basis of the degree to which trial norms consisting of various combinations of Aptitude G, V, N, S, P, Q, K and M at trial cutting scores were able to differentiate between the 62% of the sample considered to be good workers and 38% of the sample considered to be poor workers. Trial cutting scores at five-point intervals approximately one standard deviation below the mean are tried because this will eliminate about one-third of the sample with three-aptitude norms. For two-aptitude trial norms, minimum cutting scores of slightly more than one standard deviation below the mean will eliminate about one-third of the sample. For four-aptitude trial norms, cutting scores of slightly less than one standard deviation below the mean will eliminate about one-third of the sample. The Phi Coefficient was used as a basis for comparing trial norms. The optimum differentiation for the occupations of Automobile Mechanic (auto. ser.) 620.281-014 and Foreign Car Mechanic (auto. ser.) 620.281-014 is provided by the norms of N-75, S-95, and M-90. The validity of these norms is shown in Table 6 and is indicated by a Phi Coefficient of .25 (statistically significant at the .0005 level).

TABLE 6

Concurrent Validity of Trial Norms
N-75, S-95, M-90

	Nonqualifying Test Scores	Qualifying Test Scores	Total
Good Workers	39	114	153
Poor Workers	48	46	94
Total	87	160	247

Phi Coefficient = .25 Chi Square (X^2y) = 15.6
Significance Level = P/2 $<$ .0005

DETERMINATION OF OCCUPATIONAL APTITUDE PATTERN

The data for this study met the requirements for incorporating the occupation studied into any OAP-25 which is shown in Section II of the Manual for the General Aptitude Test Battery. A Phi Coefficient of .19 is obtained with the OAP-25 norms of N-80, S-90, M-80.

RESULTS OF ANALYSIS OF DATA ON SECOND SAMPLE

As indicated under "Sample Description", a second sample of mechanics not attending the training session was obtained from Volkswagen dealers in the same States as the regional training center for use as a cross-validation sample. It was not possible to develop a set of norms on this second sample and neither the final norms nor several sets of trial norms cross-validated on this sample. The means, standard deviations, ranges and correlations with the criterion for this sample are shown in the Appendix.

RESULTS OF DATA ANALYSIS WITH OTHER PREDICTORS

As indicated under "Experimental Test Battery" the Minnesota Vocational Interest Inventory (MVII) and a specially constructed biographical information blank (BIB) were administered to the validation sample on an experimental basis. The MVII did not increase the selective efficiency obtained with the GATB only. A table in the Appendix provides mean scores on each MVII occupational and area scale and shows the correlation between these scales and other variables.

The validation sample was divided into two subsamples for the BIB analysis. The key did not stand up when cross validated on the other subsample.

UNITED STATES EMPLOYMENT SERVICE

DESCRIPTIVE RATING SCALE
(For Aptitude Test Development Studies)

Score____

RATING SCALE FOR _____

D. O. T. Title and Code

Directions: Please read the suggestions to raters on the back of this form and then fill in the items listed below. In making your ratings, only one box should be checked for each question.

Name of Worker (print) _____

(Last) (First)

Sex: Male____ Female____

Company Job Title: _____

How often do you see this worker in a work situation?

- ☐ See him at work all the time.
- ☐ See him at work several times a day.
- ☐ See him at work several times a week.
- ☐ Seldom see him in work situation.

How long have you worked with him?

- ☐ Under one month.
- ☐ One to two months.
- ☐ Three to five months
- ☐ Six months or more

A. How much work can he get done? (Worker's <u>ability</u> to make efficient use of his time and to work at high speed.)

- ☐ 1. Capable of very low work output. Can perform only at an unsatisfactory pace.
- ☐ 2. Capable of low work output. Can perform at a slow pace.
- ☐ 3. Capable of fair work output. Can perform at an acceptable but not a fast pace.
- ☐ 4. Capable of high work output. Can perform at a fast pace.
- ☐ 5. Capable of very high work output. Can perform at an unusually fast pace.

B. How good is the quality of his work? (Worker's ability to do high-grade work which meets quality standards.)

☐ 1. Performance is inferior and almost never meets minimum quality standards.

☐ 2. The grade of his work could stand improvement. Performance is usually acceptable but somewhat inferior in quality.

☐ 3. Performance is acceptable but usually not superior in quality.

☐ 4. Performance is usually superior in quality.

☐ 5. Performance is almost always of the highest quality.

C. How accurate is he in his work? (Worker's ability to avoid making mistakes.)

☐ 1. Makes very many mistakes. Work needs constant checking.

☐ 2. Makes frequent mistakes. Work needs more checking than is desirable.

☐ 3. Makes mistakes occasionally. Work needs only normal checking.

☐ 4. Makes few mistakes. Work seldom needs checking.

☐ 5. Rarely makes a mistake. Work almost never needs checking.

D. How much does he know about his job? (Worker's understanding of the principles, equipment, materials and methods that have to do directly or indirectly with his work.)

☐ 1. Has very limited knowledge. Does not know enough to do his job adequately.

☐ 2. Has little knowledge. Knows enough to "get by."

☐ 3. Has moderate amount of knowledge. Knows enough to do fair work.

☐ 4. Has broad knowledge. Knows enough to do good work.

☐ 5. Has complete knowledge. Knows his job thoroughly.

E. How much aptitude or facility does he have for this kind of work? (Worker's adeptness or knack for performing his job easily and well.)

☐ 1. Has great difficulty doing his job. Not at all suited to this kind of work.

☐ 2. Usually has some difficulty doing his job. Not too well suited to this kind of work.

☐ 3. Does his job without too much difficulty. Fairly well suited to this kind of work.

☐ 4. Usually does his job without difficulty. Well suited to this kind of work.

☐ 5. Does his job with great ease. Exceptionally well suited for this kind of work.

F. How large a variety of job duties can he perform efficiently? (Worker's ability to handle several different operations in his work.)

☐ 1. Cannot perform different operations adequately.

☐ 2. Can perform a limited number of different operations efficiently.

☐ 3. Can perform several different operations with reasonable efficiency.

☐ 4. Can perform many different operations efficiently.

☐ 5. Can perform an unusually large variety of different operations efficiently.

G. Considering all the factors already rated, and only these factors, how acceptable is his work? (Worker's "all-around" ability to do his job.)

☐ 1. Would be better off without him. Performance usually not acceptable.

☐ 2. Of limited value to the organization. Performance somewhat inferior.

☐ 3. A fairly proficient worker. Performance generally acceptable.

☐ 4. A valuable worker. Performance usually superior.

☐ 5. An unusually competent worker. Performance almost always top notch.

SUGGESTIONS TO RATERS

We are asking you to rate the job performance of the people who work for you. These ratings will serve as a "yardstick" against which we can compare the test scores in this study. The ratings must give a true picture of each worker or this study will have very little value. You should try to give the most accurate ratings possible for each worker.

These ratings are strictly confidential and won't affect your workers in any way. Neither the ratings nor test scores of any worker will be shown to anybody in your company. We are interested only in "testing the tests." Ratings are needed only for those workers who are in the test study.

Workers who have not completed their training period, or who have not been on the job or under your supervision long enough for you to know how well they can perform this work should not be rated. Please inform the test technician about this if you are asked to rate any such workers.

In making ratings, don't let general impressions or some outstanding trait affect your judgment. Try to forget your personal feelings about the worker. Rate him only on the way he does his work. Here are some more points which might help you:

1. Please read all directions and the rating scale thoroughly before rating

2. For each question compare your workers with "workers-in-general" in this job. That is, compare your workers with other workers on this job that you have known. This is very important in small plants where there are only a few workers. We want the ratings to be based on the same standard in all the plants.

3. A suggested method is to rate all workers on one question at a time. The questions ask about different abilities of the workers. A worker may be good in one ability and poor in another; for example, a very slow worker may be very accurate. So rate all workers on the first question, than rate all workers on the second question, and so on.

4. Practice and experience usually improve a worker's skill. However, one worker with six months' experience may be a faster worker than another with six years' experience. Don't rate one worker as poorer than another merely because he has not been on the job as long.

5. Rate the workers according to the work they have done over a period of several weeks or months. Don't rate just on the basis of one "good" day, one "bad" day or some single incident. Think in terms of each worker's usual or typical performance.

6. Rate only on the abilities listed on the rating sheet. Do not let factors such as cooperativeness, ability to get along with others, promptness and honesty influence your ratings. Although these aspects of a worker are important, they are of no value for this study as a "yardstick" against which to compare aptitude test scores.

Please write your name, title, company, city, state, and date of rating on a separate sheet of paper for each set of ratings you make.

STATE AGENCY LETTERHEAD

V and W Volkswagen Co.
4323 Memory Lane
Forecast, Connecticut

Gentlemen:

At the request of Volkswagen of America, Inc., the United States Employment Service is conducting a nationwide study to determine the aptitudes, vocational interests, and backgrounds of Volkswagen Automobile Mechanics. The results of this study will enable local employment service offices throughout the country to refer qualified applicants for your consideration.

In connection with the study, tests were administered to one of your mechanics, John Schmidt, while he was attending the training session in Orangeburg, New York, recently. We would like this mechanic's immediate supervisor to evaluate his job performance by rating him on the attached rating scale as soon as possible and return the rating form to us in the enclosed postage-paid envelope. The ratings will serve as a yardstick against which we can compare the test scores in this study. As we are only interested in "testing the tests" neither the ratings nor the test scores will be shown to anybody in your company.

Please have the rating supervisor read the following suggestions before making his rating:

1. For each question compare the person being rated with mechanics-in-general. That is, compare your mechanic with other mechanics who you have known.

2. Rate the mechanic only on the way he does his work. Don't let general impressions, personal feelings or some outstanding trait affect the rating. Try <u>not</u> to rate the mechanic higher just because he has been on the job longer.

3. Rate the mechanic according to the work he has done over a period of several weeks or months. Don't rate just on the basis of one "good" day, one "bad" day or some single incident. Think in terms of the mechanic's usual or typical performance.

4. Rate only on the abilities listed on the rating sheet. Do not let factors such as cooperativeness, ability to get along with others, promptness and honesty influence your ratings. Although these aspects of a worker are important, they are of no value for this study as a "yardstick" against which to compare aptitude test scores.

Thank you for your cooperation.

Sincerely yours,

Correlations between MVII Scales and Other Variables
Volkswagen Mechanic Study
Trainee Data

N = 247

MVII	Mean	Age	Edu.	Exp.	G	V	N	S	P	Q	K	F	M	Sup. Rat.
A- 1*	53.5	.02	.11	.00	.07	-.02	.08	.03	-.01	.04	-.02	-.04	.03	.20*
A- 2	46.9	-.03	.03	-.04	.07	.13	.00	.07	.06	-.09	.02	.01	.05	-.15
A- 3	48.8	-.02	-.04	-.04	.04	.15	.08	-.07	.07	.12	.13	.04	.00	-.01
A- 4	54.1	.09	-.07	.13	-.07	-.13	.01	-.10	-.02	.04	-.08	-.09	-.07	.13
A- 5	49.3	-.03	.03	-.02	.14	.08	.09	.19	.13	.07	.00	.09	.09	-.12
A- 6	46.2	-.05	.07	-.05	.02	.02	.02	.03	-.03	.00	.00	-.01	-.01	.01
A- 7	48.9	-.02	.02	.01	.04	.13	.02	.04	.09	.06	.09	.09	-.03	-.12
A- 8	50.1	-.08	-.17	-.01	-.12	-.07	-.03	-.17	-.06	.01	.05	.01	-.05	-.12
A- 9	50.9	-.07	.07	.05	.03	-.02	.09	-.06	.03	-.02	-.01	-.09	.00	.06
O- 1	36.6	-.05	-.19	-.09	-.20	-.24	-.16	-.13	-.10	-.15	-.14	-.04	-.04	-.21
O- 2	34.9	.03	-.09	-.02	-.11	-.17	-.15	.02	-.07	-.09	-.12	.02	.01	-.16
O- 3	29.8	-.06	-.18	-.06	-.17	-.11	-.10	-.19	-.05	-.10	-.01	-.01	.00	-.19
O- 4	30.4	-.03	-.11	-.02	-.10	-.02	-.09	-.06	.01	-.04	.05	.05	.00	-.18
O- 5	40.7	-.04	-.10	-.02	-.03	.03	.03	-.09	.04	.04	.00	.09	.00	-.09
O- 6	32.0	.09	.00	.11	-.02	.13	-.08	.03	.00	.05	.16	.09	-.03	-.05
O- 7	29.4	-.03	-.02	-.04	.05	.13	.09	.00	.09	.13	.10	.07	.04	-.09
O- 8	37.1	-.15	-.17	-.08	-.17	-.19	-.06	-.25	-.06	-.12	-.14	-.06	-.03	-.09
O- 9	33.6	-.03	-.05	-.04	-.04	.00	-.08	.01	.01	-.13	-.01	.03	.06	-.15
O-10	27.9	.18	.11	.17	.07	.10	-.05	.17	.01	.06	.11	.05	-.03	.09
O-11	35.8	-.14	.09	-.04	.23	.21	.21	.20	.15	.14	.12	.02	.07	.04
O-12	29.7	.01	.02	.05	.00	.05	-.11	.11	.00	-.04	.05	.09	.03	.00
O-13	27.7	-.14	.02	-.15	-.02	-.07	-.02	.01	-.03	-.10	-.05	-.06	.09	-.05
O-14	37.9	-.14	.02	-.08	.03	-.08	.11	-.04	.07	-.03	-.08	-.11	-.02	-.03
O-15**	46.0	.02	.11	.01	.14	.03	.14	.10	.06	.07	-.03	-.03	.03	.19**
O-16	29.5	-.04	.25	-.04	.33	.34	.20	.36	.22	.22	.12	.12	.10	.12
O-17	42.2	-.09	.16	-.09	.21	.11	.19	.20	.09	.08	.05	.01	.05	.17
O-18	36.3	-.15	.19	-.01	.18	.14	.22	.09	.15	.09	.08	-.05	.08	.09
O-19	37.5	.12	.13	.04	.22	.18	.12	.27	.06	.09	-.01	.10	.08	.11
O-20	32.9	.10	.01	.15	.10	.06	.13	.06	.08	.14	.01	-.02	.04	.17
O-21	31.1	.08	.04	.06	.17	.15	.11	.17	.10	.12	.06	-.08	.00	.05

*"Mechanical" Area Scale
**"Truck Mechanic" Occupational Scale

Means, Standard Deviations (SD), and Pearson Product-Moment Correlation with the Criterion (r) for Age, Education, Experience and the Aptitudes of the GATB, N=129 (Mechanics obtained directly from local Volkswagen dealerships).

		Mean	SD	r
Age		29.3	8.0	.055
Education		11.2	1.9	-.019
Experience		40.0	48.3	.147
Aptitude	G - General Learning Ability	96.8	18.0	.022
"	V - Verbal Aptitude	92.8	13.5	-.019
"	N - Numerical Aptitude	90.6	18.0	.042
"	S - Spatial Aptitude	110.4	19.9	-.030
"	P - Form Perception	101.2	20.3	.054
"	Q - Clerical Perception	104.0	14.5	.028
"	K - Motor Coordination	96.2	15.4	-.049
"	F - Finger Dexterity	101.2	19.3	.291**
"	M - Manual Dexterity	109.0	19.0	.040

*Significant at the .01 level

February 1969 S-43R

FACT SHEET

Job Title: Automobile Mechanic (auto. ser.) 620.281-014
Foreign Car Mechanic (auto. ser.) 620.281-014

Job Summary:

Repairs and reconditions air cooled gasoline powered or driven automobiles by removing worn or defective parts, installing new or reconditioned parts, and adjusting to specified tolerances and within prescribed limits.

Work Performed:

Repairs and reconditions air-cooled gasoline powered automobiles of Volkswagen manufacture by removing worn or defective parts, installing new or reconditioned parts, and adjusting to specified tolerances and within prescribed limits.

1. Determines extent of repairs required: Examines Repair Order prepared by SERVICE ADVISER: Studies or reviews Repair Order to ascertain operating defects and recommendations to be considered in rendering the automobile satisfactorily operable. Locates vehicle by means of a Locator Hat. Pushes or drives vehicle to work station. Time-stamps Daily Time and Payroll Record intime clock to record time of job, insuring and facilitating the maintenance of production and payroll records by office personnel. Requisitions the required parts from PARTS CLERK and carries by hand or transports them by dolly to the work session.

2. Removes defective part(s) or unit(s) and examines them to determine serviceability: Removes part or unit by loosening and removing nuts, bolts, washers, screws, pins, or other fastenings using various hand and power tools such as pliers, screwdrivers, wrenches, hammers, hydraulic lifts and jacks. Measures removed part to determine extent of wear, using special provision measuring instruments such as micrometers, depth gauges, and dial indicators. Compares present condition of part with condition when new as reflected in handbook, Without Guesswork, to determine variance from factory tolerances. Notifies SHOP FOREMAN if number of new parts of extent of repairs will exceed the estimate indicated on the Repair Order or if replacement of a part is found to be unnecessary.

Installs new or reconditioned part or unit: Installs and fixes in place parts or units such as engine, trans-axle, generator, oil pump, fan, housings, locks, lights, and instruments using various hand and power tools. Adjusts parts to factory specifications using specialized tools such as Compression Meter, Torque Wrenches, feeler gauges, micrometers, depth gauges, calipers, and electrical meters which render readings under load conditions. Adjusts carburetors by turning adjusting screws while listening to engine to determine optimum operation. Balances dual carburetor systems by regulating amount of air intake using Airflow Gauge. Overhauls and reconditions major operating units: Disassembles

unit and visually or by use of gauges and other precision measuring instruments, inspects and measures pistons, bearings, gears, and other parts to determine degree of wear or other deficiency or irregularity. Replaces necessary parts and rebuilds unit to factory specifications using shims, abrasive grinding tools, reamers and files. Tightens bolts, nuts, and other fastenings to insure secure fit. Lubricates moving parts and units to effect alignment and clearance within prescribed limits, insuring optimum action or motion.

Repairs electrical system: Removes defective wiring, and installs new wiring for the ignition system, lights, instruments, and accessories, using hand tools such as wrenches, pliers, and screwdrivers. Disassembles and rebuilds starters and generators, replacing inoperative parts such as armature, field coils, brushes, ball bearings, voltage regulator, overrunning clutch, solenoids, and other switches. Removes ignition coil, spark plugs, distributor points, condensers and other ignition parts using various hand tools and occasionally a hydraulic press. Replaces old parts with new ones and adjusts according to factory specifications.

Performs recommended preventive maintenance services: Verifies oil level in crankcase, trans-axle, reduction gear, and steering gear. Changes or adds oil as needed and cleans strainer and magnetic-drain-plug. Lubricates front end, brake cables, pedal linkage, door locks and hinges, and the carburetor linkage. Visually inspects, adjusts, cleans or replaces as necessary, the fan belt, fuel pump filter, distributor breaker points, spark plug gap, clutch pedal, freeplay steering assembly and linkage, brake system, valves, torsion arm link pins, and electrical system. Measures engine compression to ascertain that it is within normal limits. Inspects tires for damage and wear, and adjusts air pressure. Tests vehicles for performance by driving it in road traffic under normal operating conditions.

Effectiveness of Norms:

Only 62% of the nontest-selected workers used for this study were good workers; if the workers had been test-selected with the S-43R norms, 71% would have been good workers .38% of the nontest-selected workers used for this study were poor workers; if the workers had been test-selected with the S-43R norms only 29% would have been poor workers.

Applicability of S-43R Norms:

The aptitude test battery is applicable to jobs which include a majority of the job duties described above.

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